THE

COMMON SCHOOL JOURNAL.

VOL. V. BOSTON, SEPTEMBER 15, 1843. No. 18.

AMERICAN INSTITUTE OF INSTRUCTION.

[We extract the following notice from the Berkshire County Whig, for Thursday, August 24, 1843, omitting some portions and making other unimportant alterations.]

The American Institute of Instruction held its annual meeting, for the first time, in this place, continuing from Tuesday morning to Thursday evening of last week. The Commencements at Yale and Williams' Colleges taking place contemporaneously, and want of general notice and *understanding* of the nature and objects of the Institute, prevented so full an attendance of the citizens of the county, as was very desirable on their own account, and as otherwise would unquestionably have occurred. This, however, did not detract from the fulness, weight and beauty of the treatises delivered on the occasion; and their publication will more than compensate any deficiency in hearing, by spreading them more diffusively for the reading and meditation of the people. The addresses and lectures delivered at this session, were distinguished for their practicalness and unity. They evinced that the leading, governing objects were truth,—true science and real art, and a correct and complete system for attaining both. We may say, without fear of contradiction from those who attended the whole course, that seldom, if ever, did they witness more modesty and talent, more freedom of thought and harmony of opinion, a greater variety of experimental knowledge, all tending to illustrate and edify Common Schools, than were exhibited by the productions of those practical teachers; for, from the first, Dr. Humphrey, to the last lecturer, Rev. Mr. May, all were, or had been, schoolmasters.

We cannot now go into a line of extended remark on the benefits to be conferred on the community by the organized and systematic labors of the American Institute of Instruction. But we cannot refrain from expressing, in behalf of the people in this vicinity, our gratitude for its advent among us. There was no other way in which we could have had such a *sense* of its character, such a perception of its offered benefits *to us*. Knowledge of the earth, of the elements within it, of the vegetables springing from, and of the animals feeding upon it, should

be made accessible to the pupil of the common school. The knowledge of man in his physical structure, the instrument by which he moves, or reads, or writes, or studies, or recites, by which he speaks and acts, should be accessible to the pupil of the Common School, that he may be taught how to do either exercise in the best manner and to the greatest advantage,—that he may preserve his health and improve all the faculties of his body. The knowledge of literature, if not acquired through, is intimately associated with, the knowledge of things, leading and tending, from the beginning, up to nature's God. Thus Common Schools would be in the way of becoming what our forefathers, their founders, designed them to be, a nursery of literature, morality and religion for all and the whole of all generations; in fine, to be the colleges of the people.

Are any opposed to the introduction of natural history and other kindred studies into our Common Schools? Let them correct their sentiments by recollecting with what enthusiasm David celebrates the inspirations of praise and thanksgiving to the Creator for the human and the planetary systems? How does the pious, the devout Young, magnify the visible universe!

"Scripture's self a *fragment*, that *unread!*"

Is any fearful that the investigations of science will weaken the evidences of revealed religion,—invalidate the Scriptures? What presumption! As if God himself should dictate a book to Moses and the prophets, in contradiction or at variance with his own written volume of creation!

Dr. Humphrey, in his introductory discourse, on the morning of the meeting of the Institute, divided education into three branches, physical, intellectual, moral and religious, but treated only of the last. He said he considered it the most important branch, indeed, in some degree indispensable; for the man wholly devoid of it, with the best physical and intellectual training, would be but an animal or a demon. The introduction of the Bible into Common Schools as a class-book, he thought important, as even in this State there were many families that did not attend religious worship on the Sabbath, nor Sunday Schools, nor read the Bible, nor offer up prayers; so that if religious instruction, or lessons of morality were not given at the Common Schools, the children of such families must be heathen in a Christian land. He deemed the Bible the best reading-book extant, for the exercise of the voice, for giving it inflexion, intonation and cadence, for improving the taste in composition, in poetry or prose, in sentiment, and imagery, displaying all that is pure in thought, righteous in conduct, powerful in action, holy in purpose,—in fine, whatever is sublime or beautiful. He instanced the history of creation, the story of Joseph, the allegory of Job, the Psalms of David, the divine compositions of Isaiah, and the Revelations of St. John, as surpassing all other compositions. He considered the Bible as the best class-book, because it taught the best morality that had ever been taught in the world; because it is the basis of all the morality in the land; because it was the cause of the character and condition of New England; being

the basis of the individual, social and civil conduct and polity of our forefathers, who brought it with them in their bosoms, as the man of their counsels in all their actions; because it inspires civil and religious liberty and consecrates it with the attestation of God himself. He cited Mr. Webster, Mr. Young, the Superintendent of the common schools in New York, and Washington, the father of his country, in proof of all that he had said of the vital importance of morality and religion, and of the efficacious influence of the Bible, and concluded with a most apposite and pathetic peroration.

[In the afternoon, Mr. Solomon Adams, of Boston, gave a lecture, the object of which was to show the importance of leading the pupil to the habit of *patient reflection*, and a *correct classification* of knowledge. Pupils are in danger of resting satisfied with a verbal statement of facts, as given in text-books, without a distinct apprehension of the facts themselves. Their knowledge of the *book* is often better than their knowledge of the subject of which the book treats. The origin of this habit was traced to the faulty manner of their first instructions. Much time is wasted on the *alphabet*, the "*abs*," and *spelling-columns*, without giving a solitary idea of any value to the learner. The child very naturally concludes that it is not the object of the book to give him ideas. In this manner a habit is early formed of learning words without ideas, and is apt to be carried into the subsequent studies of the pupil. This error was made palpable by pertinent illustrations.

Manage first instructions in such a way as to awaken thought, and impart new ideas. Spend little time on the *names* of the letters. They are easily learned by children as an amusement, by means of cards or blocks. It is by no means essential that the names of the letters should be known at first. They afford no aid in pronouncing words. Take names of familiar objects; analyze them into elementary sounds, and teach the learner the *power* of the characters employed to represent them. At the beginning, and through the whole course, use the book only as a highway to conduct the traveller to something beyond itself. A Treatise of Astronomy is a *book*. The things to be known are in the heavens,—the sun, the moon, and the stars, and the laws which the Creator has imposed on them.

A knowledge of facts, however well ascertained, is not of itself wisdom. They must be arranged according to the natural laws of association, in such a manner that one idea will be a rallying point for many others. We want mind so trained that it will be able to know and measure its own power, and trust to it. We want ideas like troops, *drilled*, *marshalled* and well *officered*, and ever ready to do battle.

Lead the pupil through such processes that he will arrange knowledge for himself, and arrive at general principles. This important suggestion was illustrated at length by examples from experience.

Another suggestion was that the advanced pupils should take important subjects, for the purpose of collecting information,

and arrange in writing their collection of facts relating to the subject.

Lastly. Teach by example. Be, in all good learning and healthful mental discipline, what you would have your pupils be.]

After the lecture, H. Hubbard, of Pittsfield, remarked that the principle of this lecture, in regard to classification, is coincident with the doctrine laid down in Duncan's logic, that the object of science is two-fold, first, to enumerate the qualities of things, (which includes facts and phenomena,) and second, to arrange or classify them. These are two distinct offices of the mind, requiring the distinct action of two separate faculties; as may be most signally illustrated by the works of two most remarkable men in the legal department. Lord Coke, who was called law itself, had an immense power of enumeration or collection, but not so great a power for arrangement and classification, which probably is the cause of his not being, as Judge Kent says, always clear. Judge Blackstone possessed both faculties, but the latter in a transcendent degree; hence he formed a system of the laws of England, as exemplified in his commentaries, which is pronounced the most complete and perfect system ever formed in any science. Lord Mansfield said, had he had the benefit of its use when he first read law, it would have saved him two years of study.

Mr. Emerson, the President of the Institute, at the close of the session, elucidated the new system of teaching children, which it was an object of the Institute to introduce, and which Mr. Adams had explained and enforced. It was to take the child into the street, or into the fields, and in view of objects, their properties and relations, when the image and perception was warm and full in the mind, to give him the words which were the names of them. Also to bring minerals, flowers, and other natural objects into the schoolroom, and there, amidst the sensations of the hardness and weight of the one and the beauty and fragrance of the other, let the little learners be taught the words by which they are called. The child would thus learn the alphabet of letters in the alphabet of things. The child would not be kept at his a, b, c's, a year, two years, and even three years. He would be no longer wearied and perplexed with the abs, syllables of nonsense, nor with columns of words which are full as insignificant and nonsensical to him. Thus several years would be saved in the learning of letters and words. And then the spelling, as a distinct exercise in school, should be merged in writing, which is incalculably the best way to learn to spell, and at the same time another and most important branch of learning is facilitated and made more interesting in the acquisition.

[The mode of teaching to read by means of words first, and the many advantages of this course, were very fully and ably illustrated, in an excellent lecture by Mr. Peirce.]

Mr. Page's lecture on advancement in the means and methods of instruction, was full of practical remark executed in the best style. What supersedes all commentary on our part, is that

the Institute voted to publish an extra number of two thousand copies of the lecture for gratuitous circulation.

[Mr. Greenleaf gave a good discourse on "The Faithful Teacher." It may be safely said that no one is capable of delineating this character fully who may not, if he will, exemplify it in his own life. And if a strong feeling is an indication of power, this must be the case with Mr. G.]

Mr. Howard's discourse on a few of the hows in teaching, exhibited tact and wit, and seemed to say,—here is a schoolmaster who appreciates his high calling in its honor and responsibility. Though Mr. Howard professed not to be aiming at fine writing, he closed his address in a very fine style.

Professor Agnew, of Newark, also read a discourse principally on the moral branch of primary education; as did Mr. Hubbard, of Worcester, on the prevailing taste for slight rather than thorough education, for fiction rather than truth, and for getting honors and station rather than doing anything good or useful. Both these gentlemen approved the Bible as a class-book.

Dr. Lambert delivered, in a very pleasant manner, an oral lecture on anatomy and physiology, with illustrations by means of the manikin.

[In this lecture Dr. Lambert gave a most favorable specimen of the able manner in which he lays down the laws of health, and shows their great importance, while he explains the structure and functions of the various parts of the body. It is gratifying to learn that, as a lecturer, Dr. Lambert is meeting the encouragement which he so richly deserves. Few things would add so much to the happiness of our population, as to be instructed in the valuable principles which Dr. Lambert enforces.]

Mr. Murdock followed, with a written discourse on enunciation and vocal gymnastics,—exemplifying its principles by recitations from Pope, Milton, and Shakspeare, with great effect. No one but can perceive, on the first development of enunciatory and vocal action, why Socrates associated medicine with rhetoric; and of course be anxious that anatomy and physiology should be taught in our schools of all sorts, where speaking or reading is taught,—and especially in the primary, the Common School,—in which the powers of the voice are apt to be unequally, deficiently and injuriously exercised.

[Mr. Murdock showed the great value of proper instruction in the use of the voice, in giving it clearness, accuracy, compass, variety and force, and making it in the fullest degree expressive of the thoughts and emotions uttered; at the same time that he proved his ability as an instructor in elocution.]

Mr. May read a letter from Mr. Charles Brooks, proposing to introduce into the Common Schools the study of natural history. By reference to the above remarks of Mr. Emerson, it will be perceived what a coincidence there is between his views on the subject and those of Mr. Brooks. The latter, in his letter, truly said that by the introduction of the study of natural history, the world became a schoolroom in which God was the teacher.

The last discourse in writing, was by Mr. May, on the wants of our Common Schools. He said the principal want of Common Schools, was a due appreciation of them by the public. They are the colleges of the people, and the people are the sovereigns. Should not the sovereign, in a republic, be educated as well as the sovereign in a monarchy? The children in a republic are heirs in copartnery to the sovereign, as the child of the king is sole heir in a monarchy. Shall there be less public interest in a state or nation, with regard to the proper education of the former, than of the latter? All England felt an intense interest and concern in the education of the princess Charlotte, when she was only presumptive heir to the throne,—though liable to die before she arrived even at the coronation, as in fact she did. And shall we take no interest, feel no concern for the education of whole generations, who are heirs apparent to the supremacy, being clothed with the absolute right of primogeniture, and liable only to the smallest possible chance of entire extirpation by death? The public do sympathize with the Institute on the subject, and in the belief that acting favorably on the schools causes them to advance, and thus a reciprocal action is generated, conducive to the most beneficial and permanent results. Other wants were briefly considered, and the address was closed with a most powerful appeal to the audience, who were greatly pleased and interested by the discourse.

At the first and second evening sessions, the question whether corporal punishment should be entirely discontinued in Common Schools, was debated. Dr. Mason, of New York, advocated the affirmative, on the ground that it was a barbarous custom,—that as discipline it was unnecessary in ordinary cases, and inefficacious in extraordinary ones; that is, where moral suasion will not prevail. But were it efficacious, and not brutal, he would not use the rod on another's child, because he had no right to do so. The incorrigible by moral discipline, he would turn from his school,—for he was destined to be a vagabond, and the sooner he became so, the better.

Mr. Peirce, of Nantucket, followed on the same side, differing from the former in the manner of separating the incorrigible, which he stated somewhat in this way: "James, I have always wanted to do you good, and still do, but you have not been willing, and are not now, to receive it from me, and therefore, James, we must part, until you are willing to receive it; and when you are, do you, James, come back to the school; for I shall always want to do good to you, and will ever do it, when you will receive it." The simplicity and affectionateness in which the patriarchal pedagogue (for he said he was proud of the name,—the leader, the teacher of children) spoke, made a moral impression on those who heard him, that time will not efface. And every heart believed him when he said that no boy had ever been dismissed from his school, who did not return a penitent. This is carrying out moral suasion, and the fruit of it when it is *fully* carried out. Self-government, he said, was the secret of governing a school. He said he liked the practice of deferring action upon a case of one being in

fault, to another day; it gave time for conscience to work and passion to cool;—but he must ever protest against any scholar, in any case of disobedience, being thrust from the school as a reprobate.

On the opposite side, Mr. Page made some very sensible and effective remarks. He doubted if the rod could, in all cases, be dispensed with, consistently with government, even by the most prudent and skilful; but the practicability of the measure was not to be tested by such qualifications, but by those of the actual teachers, and therefore, if corporal punishment is to be immediately repudiated, the operation of the Common Schools must, to some extent, greater or less, cease, till competent teachers are found, if extant, or created, if not. He was for the least use of the rod, practicable, particularly and universally, and the use of it was scarcely more than a potentiality with him, but even that may be a necessary or powerful motive to obedience.

On the following evening the last idea was illustrated by a statement of Mr. Kingsbury, made, however, independently of and without any reference to it. It was, that, in a school he kept, a knot of large boys, from having literally put the preceding master out of doors, made advances towards the same or a similar step with him,—whereupon he applied the ferule to one, but unluckily it split, and the relieved patient laughed outright. He, however, brought into the schoolhouse, and laid conspicuously on his table, an oaken ferule, two feet long and two inches in diameter, and with sharp edges. The passive instrument subdued the rebellious boys into obedient and affectionate ones, and maintained the peace and order of the school to its close.

Professor Agnew spoke at length in favor of corporal punishment—justified it on principle and by authority, and considered the use of it lawful and necessary.

Mr. Greenleaf made some very practical and striking remarks in favor of the use of persuasion and corporal punishment when necessary in the last resort, in the Common School.

This is a very faint outline, though it is hoped it will present the distinctive traits of what these gentlemen stated to be their sentiments and opinions on the subject. The various arguments and illustrations, the spirit and wit of the speakers, are not attempted to be detailed. When the debate closed, no question was taken,—the decision being left to the meditation and judgment of the public.

At the last evening, after Mr. May had delivered his address, Dr. Mason rose to express his views of the principles of the Institute,—the character of some of its first founders, particularly of Dr. Wayland, its first president,—the good it had done throughout eastern New England, and most signally in Providence, R. I., and the melioration its principles had produced and were producing in the State of New York. He bore testimony to the great benefit he had received from the instruction afforded him by the excellent discourses which had been delivered at this session of the Institute,—excellent for their

experimental knowledge and results. He was desirous that the Institute should hold its next annual meeting at Utica, N. Y. Mr. Peirce followed with a most earnest appeal to the people to foster and encourage Common Schools, and in their family and public prayers to remember them at the throne of grace.

Mr. Agnew, after earnestly soliciting that the next meeting might be held at Newark, N. J., moved that the thanks of the Institute be given to the citizens of Pittsfield, for the reception and accommodation extended to its members on this occasion. Mr. Emerson, the president, stated that the Congregational church and the lecture-room had been opened to them and lighted, and notice of the meetings given by ringing of the bell, all gratuitously. He made a short but exciting address to the instructors of Common Schools present, encouraged them in improvement, perseverance and fidelity in their vocation,—to cherish a respect and attachment to it,—to look for a higher reward for their labors than honor or emolument, namely, a self-satisfaction in having performed a most important service to individuals and the community, and a lively hope of receiving their reward hereafter.

Redeem time for study. The busiest workman can spare some moments.

Whether you work or play, do it in earnest; but never be unemployed a moment.

SIXTH ANNUAL REPORT OF THE SECRETARY OF THE BOARD OF EDUCATION.

[Continued from page 268.]

5. Another system is that of the Blood Vessels, or of the Circulation. It was said above that no part of the surface of the body could be pricked with the point of the finest needle, without striking a nerve; and this is equally true in regard to the blood vessels;—that is, both the nerves and the blood vessels lie so closely side by side, that a needle cannot find any unoccupied space or interstice between them. Although the whole blood of the system pours through the heart, and issues forth from it into the aorta in one great stream, yet this stream is afterwards so minutely subdivided as to reach every part of the body. Not the space of a pin's point is deprived of it, for if the blood should cease to nourish any part, that part would immediately perish with mortification. Hence the current must have its winding passages, its arches, its culverts; and when it reaches the bones, it must descend into them, as by subterranean channels, to permeate and nourish their solid structure. Nor does this process of circulation consist, as we are accustomed to suppose, in the mere flowing, round and round, of the same fluid. The blood carries nutritious particles, as its freight, and every point in the whole body is a port

where it unlades its treasures; and, in return, it receives the waste or used-up particles, which every part of a healthy body is constantly throwing off.

Besides all these, there are the Lungs, or the Respiratory System, the systems of Absorbents, Lymphatics, Secretories, Excretories, &c. &c.—all going to make up that one mechanism, which with brevity we call the Human System. Physiologists enumerate more than twenty of the elementary, or compound tissues of which the body is composed.

But what I mainly aim at here is, to direct attention to the differences which obtain amongst all these component parts; and, therefore, to the necessity of some knowledge of each. How entirely unlike each other, both in structure and function, are the solid and fluid portions,—the bones and the blood, the opaque muscle and the transparent humors of the eye, the vegetative and almost insentient hair, and the keenly living nerve, the stomach which is the principal organ of digestion, and the lungs which are the principal organs of respiration. One thousandth part of what we daily take into the stomach would kill us instantaneously, if taken into the lungs. What is indispensable to the lungs, would extinguish life in a moment if taken into the blood vessels. And so of the rest. The truth of practical importance to be noted here is, that each system not only has its peculiar uses, but is liable to its peculiar diseases; and therefore needs its peculiar care. The hard and cohesive bones are liable to become either brittle or soft. The softer parts,—the heart for instance,—is liable to ossification, which is only a bone made in a wrong place. The muscles are attacked by rheumatism and spasms, the lungs by consumption, the liver by hepatisis, and the digestive organs, which in this country are abused more than any others, by a host of maladies greater than any other.

Hence the necessity of our knowing each organ and its functions; for how can one wisely superintend a complicated machine who is only acquainted with one, or with but a few, of its parts? All these various systems are brought together, compacted and harmonized into one. Within the narrow compass of our frames are collected, and placed side by side, all contradictory and conflicting elements,—earthy matter which will not burn, and phosphorus which takes fire by exposure to the open air; oil and water; fire and water; acid and alkali; solid and fluid; vegetable and animal; iron and the oxygen that corrodes it. And these are not only made to agree, but to coöperate; they are not merely tolerant of, but essential to, each other. Each, however apparently hostile, is indispensable to the well-being of all the rest. Such are the wonderful ingenuity and marvellous adaptations of a mechanism, respecting which, though our life and welfare are dependent upon it, we are content to remain in profound ignorance!

What but an ignorance of the plurality of our vital organs can account for the fact that men are so heedless of an attack upon any one of them, because the rest are in a sound condition? An ambitious student thinks little of an over-excitement

of the brain, because, as he says, he is perfectly well in other respects,—his digestion is good, his lungs are sound, his muscles are strong. But when the over-working of the brain brings on inflammation, and this matures into insanity, of what avail then is his good digestion, or his sound lungs, or his strong muscles, only to render him a more formidable and destructive madman? A mother is subject to colds and coughs, but her appetite is good, her nervous system is steady, and her mind clear. Why should she be alarmed at occasional pains in the side? But when successive exposures prolong a cold into a permanent inflammation, and consumption follows, every vital part, however vigorous before, must now perish with the lungs. And so of each of the many vital organs on which life is dependent. We retain existence only on the condition of taking care of them all. We talk about *the seat of life*, as though the vital principle had some *one* fortress or citadel, by the defence of which our existence would always be safe. But life has no such *one* citadel; or if it has, it is assailable through a hundred gates, at any one of which, death may enter and expel it.

The various systems of the body are not only designed to work harmoniously together, but, in a healthy and proper child, they are endued with proportionate and corresponding energies; they are preädapted to last and to work for equal periods of time. The stomach was not made to last for ten years, and then to break down; the lungs for twenty, the heart for thirty, and the brain for forty or fifty, and so on; but an identical term of existence was imparted to all, so that they might run on in the race of life together, and come simultaneously to their goal. Yet, owing to our ignorance and mismanagement of ourselves, and especially to the mismanagement of children by ignorant parents, one or another of these great vital organs is destroyed, while the rest are in comparative health and vigor; or some two organs, by different abuses, incur diseases which require incompatible remedies; so that what is done to cure the disease of one, aggravates that of the other. Not one individual in a hundred, in our times, dies of old age,—that is, after each of the vital powers has expended its quantum of force, and when the whole sink together to a peaceful close. In more than ninety-nine cases in every hundred, death is a terrible struggle between the vital energy of a majority of the organs, which cling with strong tenacity to life, and the fierce disease or premature decay of some other, which drags them reluctant and resisting down to the grave. Thus are the value and productive force of the healthful organs annihilated and lost. A business partnership or corporation may be dissolved, and each of its constituent members may enter some other sphere of industry to provide support for a dependent family, or to add something to the common weal. But in this partnership of the vital powers, the withdrawing of any one partner causes not only a dissolution of the firm, but the death of all the other members. There is no survivorship. If one perishes, all perish. How often do we see this exemplified, when,

from the decay of some one only of the vital powers, a clergyman, who is a minister of religious consolation and hope to his people, is removed in the prime of his life, and in the midst of his usefulness; or a mother, on whose counsel and guidance a family of children are leaning for support, sinks to an untimely grave; or a statesman, upon whose life the welfare of millions seemed to hang, is hurried prematurely to the tomb. In such cases we ungratefully and impiously attribute the event to the interference of our Heavenly Father, when we might as well embark all our treasures, our friends and our family, on board a ship which had some one fatal defect, and because she foundered in the first gale, or was dashed to pieces on the nearest rocks, throw the responsibility upon Heaven, for not having suspended the laws of nature to save us from the consequences of our own folly. Why did our Creator give us these faculties of inquiry, of forethought, of prevention, if we are not to use them? And what the necessity of our using them, if He were always to stand by and rescue us from the effects of our premeditated fool-hardiness? The possession of the power is accompanied by the obligation to use it,—that is, to learn and to obey the wise and beneficent laws of the Creator. His language in regard to the physical law, seems to be the same as in regard to the moral,—that it is easier for heaven and earth to pass, than for one tittle of the law to fail.

The first developed power of the infant is that of taking the food which is to be metamorphosed into the tissues of its body, —to be turned, by the transforming power of the organs, from dead substance into living and sentient material. The main preparation of food for the purpose of nutrition is effected in the stomach. The stomach is an organ of curious construction, and it is endowed with astonishing properties. Its appearance is simply that of an oval or oblong sac or bag, suspended across the body from left to right, just below the diaphragm, and a little below midway of the trunk,—the largest end being situated on the left side of the body. It is separated from the heart and lungs only by the diaphragm. On the upper side of the stomach and towards the left, there is an opening, where the food which we swallow is received; and, at its other extremity, on the right, another opening, through which the food when properly digested passes out. If the stomach had no property beyond that of a common bag or vessel made of cloth or skin, it is obvious that it would hold, in a quiescent state, whatever was poured into it, except so far as motion might be communicated to its contents from without. But it is indispensable, for the purposes of digestion, that the food taken into the stomach should be kept in constant motion; otherwise, the solid and heaviest particles would sink to the bottom, the lightest would float upon the top, and their specific gravities would be their law of arrangement. But without continual agitation, the simplest food could no more be turned into *chyme*, (which is its condition when it passes out of that organ,) than cream could be turned into butter, without that agitation which we call churning. And could the food be ever

so well digested, yet, without this motion, how could it be thrown out afterwards? The stomach is therefore endued with the power of spontaneous or involuntary motion. Food is the natural excitant of this motion. Hence, in every healthy stomach, as soon as food enters it, motion is commenced, and is continued until digestion is completed, and its contents, in the form of chyme, are discharged. To effect this motion, the stomach possesses *two* distinct sets of muscular coats, each coat consisting of fibres which pass around, respectively, in opposite directions. Suppose an egg, instead of a hard shell, to have a soft skin, and suppose this skin to consist of two sets of muscular fibres, one of which should run around it from the large end to the small one, while the other set should run round in a transverse direction,—that is, in the line of the shortest circumference. If the longer fibres of this covering should contract, (and it has been before mentioned that the power of contraction, or shortening themselves, is the property of all muscles,) it is obvious that the egg would be made more nearly round, and its contents compressed from the ends towards the middle. If, then, these longer fibres should relax and the shorter ones contract, the egg would be elongated,—the contents being pressed outwards towards the ends. Now these sets of fibres might be so alternately contracted and relaxed, as to drive the contents of the egg round and round, from side to side, and from end to end. And such is the structure and action of the stomach.

These motions of the stomach are primarily necessary for the purpose of mingling with the food a certain ingredient which is indispensable to digestion. This ingredient is a fluid, and is called the *gastric juice.* It is effused or exuded from the mucous membrane or inner coat of the stomach. For the process of digestion there is no substitute for this fluid, nor has any thing like it ever been prepared by the art of man. Boiling in water, for any length of time, will not digest food. Roasting, baking, the action of fire in any form, or of steam, or of any chemical solvents, will not accomplish the object. So far as we know, there is but one agent in the world which has this power, and but one place where that agent is found. That agent is the gastric juice, and the stomach the place of its preparation.

As soon as a mouthful of solid food is received into this organ, its flexible sides immediately contract upon it; and, if not interfered with by having another mouthful forced in too soon, they clasp it, and hold it for the space of a minute. By this clasping movement the gastric juice is shed out or expressed, and then, by the motion of the food round and round, the juice is intimately mingled with its whole mass. Important practical rules will, by and by, be deduced from these arrangements of nature.

The natural food of the infant being milk, and this being a fluid, it is obvious that the above-described motions of the muscular coats, can propel it round and round, until each drop of it is brought into contact with the gastric juice, by whose agency and mixture it is coagulated. This is the first step in the pro-

cess of its digestion. Yet so ignorant of this fact are many mothers, that when an infant throws up a little curd from the stomach, they take it as a sign of sickness and hastily administer an emetic.

But what shall be done when the child begins to require more solid food,—bread, meat, fruit, vegetables? The coats of the stomach, which are softer and more flexible than wash-leather, remain as before. The inner surfaces of this organ do not now become harder, to correspond with the more solid food received. They are not converted into a triturating apparatus, like the gizzard of a fowl, for the purpose of breaking down and grinding the solid food which the system is now prepared to assimilate. Nor is this organ suddenly provided with any cracking machine, like that of a lobster, by which hard bodies, —shells or bones,—can be pulverized and adapted to the wants of the system. What corresponding provision, then, has nature made to meet the new wants of its child?

Simultaneously with the period when the body requires more concentrated aliment, and the stomach is prepared to receive substances of a firmer texture, the teeth appear. Whoever knows the structure of the stomach, and therefore its inability for effecting the minute mechanical division of any hard, tenacious or cohesive material, can have no doubt as to the necessity and proper function of the teeth. And here the first great sin against the laws of health is committed, with few exceptions, by all the people of this country. We eat, not merely with indecent, but with unhealthful haste. As a nation, we have a profusion and an attractiveness of food, such as no other people upon the earth enjoys. We consume quantities which would astonish the inhabitants of other countries; and these quantities are often swallowed *en masse*, almost as a wild animal gorges its prey; and, of course, without that mastication which is indispensable to health. In eating, we dispense with the use of the teeth, as though our stomachs were provided with some machinery,—a grater, a pestle and mortar, or an upper and nether millstone,—to do the work of comminution. But such not being the case, it follows that if we would enjoy health, our food must be finely ground before it is swallowed; for nothing is more certain than that food which is insufficiently masticated, will be imperfectly digested; that what is imperfectly digested tends to produce disorder through the whole alimentary canal, and cannot make good blood; and without good blood, we cannot have good health, good spirits, or the full use of any of our faculties either bodily or mental.

Another reason for retaining the food in the mouth for a long time is, that there are certain glands, opening into the mouth about the cheeks and jaw-bones, which throw a great quantity of saliva into this cavity during the process of mastication. Food saturated with this saliva before entering the stomach, is much more easily digested. The saliva, too, has a strong affinity for air, and in this way the oxygen of that element is carried into the stomach, and there, by its combining with other elements, caloric is given off, which helps to raise the

stomach to a higher temperature, and thus aids the process of digestion.

That food may be taken slowly, it ought to be taken in company, and with agreeable conversation. Mental pleasures should save our meals from the grossness of mere animal enjoyment. Cheerfulness should always preside at the table. Food fails of half its nourishing qualities, when eaten in solitude, in sullenness, or with any painful or dissocial feelings. No family will enjoy a full measure of health, any more than of domestic tranquillity, who are habitually selfish, morose or unkind at their meals. Care and anxiety of mind should never be guests at the family board. The very secretions of the body are vitiated by anger, solicitude, or any of the painful emotions. The fruits of the labor of man never nourish us so much as when they are taken with good-will towards all mankind; and it is one of the *physical* conditions of deriving the greatest benefit from the bounties of Heaven, that they shall be received with gratitude to their Author.

Another strong argument in favor of taking our food slowly is founded on our knowledge of the capacity of the stomach. Man is sometimes defined to be an *omnivorous* animal, which seems to be understood by many people to mean,—not that he is capable of eating some of all kinds of food, but that he is able to eat all of each kind. Instead of supposing that the stomach does not occupy more than one twelfth of the cavities of the trunk, they seem to reverse this proportion, and to graduate their indulgence of appetite accordingly. An ordinary-sized stomach of an adult is generally said to be capable of holding about three pints; and some physiologists are of the opinion that the quantity of gastric juice poured into this organ, at a hearty meal, is one pint. Supposing, however, that only two thirds, or one half of this quantity of gastric juice is poured into that organ at a meal,—if we eat slowly, the stomach is filled with the food and with the gastric juice at the same time; and when the natural limit of its distension is reached, appetite vanishes, and a feeling of satisfaction ensues. But if we eat rapidly or gormandize, the stomach is filled with food alone, and the gastric solvent must be afterwards injected;—that is, when this organ is already brimmed, its muscular coats must be strained or distended for the reception of more. As digestion cannot begin until this juice is intimately mingled with the food, the stomach labors to discharge a sufficient quantity of it, and also to make room to receive it. Though full, it must force in more as the means of preparing its contents for egress. It is obvious that such a strain upon its muscular fibres must weaken them. They become like a bow which has been bent so far as to lose its elasticity. A few repetitions of such abuse will impair the tension of the muscles for years, perhaps for life. Instances occur where, through a beastly indulgence of appetite, the muscular coats of this organ are so strained that they lose their contractile power, and remain, like a man beneath a load which he cannot lift. In such cases, the stom-

ach becomes a motionless, that is, a lifeless organ; the food remains a foreign substance, and death speedily ensues.

Another fact deserves remark under this head. The watery parts of our beverage, or liquid food, are not digested, but absorbed. In eating slowly, time is given for this process of removal; but in eating rapidly, the organ is encumbered, at once and without relief, by the accumulated bulk and weight of all we swallow.

And again,—however solid the food we take, whether meat, unsodden vegetables, or the fruit of nuts,—hardly less solid and indigestible than the shell that encloses them,—it must all be reduced to a pulp, to a soft, semi-fluid substance, before it is prepared to pass out of the stomach, to be carried into the circulation, and be deposited in infinitely minute particles, over the system, as a part of the living organization. Now, as every one knows, all solid masses, when saturated with, or steeped in water, until they become soft, are greatly enlarged in bulk. If then the stomach is filled with solids, how much must it be overstrained when the volume of these solids is enlarged by their being reduced to a fluid. The farmer is familiar with cases of this kind, for it is the cause of death to neat cattle or horses who gorge themselves with dry grain, and then have access to water.

I will add but one more reason why all our food should be masticated, until it is ground to a powder, and, being mixed with saliva, becomes almost a fluid, before it is thrown into the stomach. The gastric juice cannot penetrate at once to the interior of solid lumps, or hard knots of food,—of compact muscle, or of tendinous or ligamentous substances. In such cases, it must commence the dissolving process on their outsides, and only when the outer layer is dissolved and removed can it begin to operate upon the next layer, and so on, until the whole process of solution is effected. This occupies much time, and, while the gastric juice is at work on the exterior of the mass, a most unhealthful fermentation, or chemical change, caused by heat and moisture, is going on in its interior.

Yet, notwithstanding all this accumulation of mischiefs, so obvious as soon as stated, how common it is for most parents, to hurry children at their meals, even beyond the rate prompted by the keenness of young appetites. Not only example, but commands are added to the impulses of hunger, and thus a habit of gorging food, as unseemly as it is unhealthful, is formed, which lasts them through the shortened life it allows. Derangement, weakness, inflammation of all the digestive organs, throughout their whole extent,—dyspepsy, that prolific mother of diseases, follow in the train of this unbecoming and unnatural practice. The food being the material from which all the tissues of the body are formed,—the crystalline humors of the eye, the exquisitely delicate substance of the brain and nerves, the finely-wrought muscles,—unless this food is well prepared before it enters the circulation to be distributed over the frame, it is in vain to expect organs which are sound to the core; it is in vain to expect muscles, compacted to the power

of greatest endurance, or acuteness of the senses, or nerves quick-answering to the commands of the will. A spinner, from wool half-combed, half-carded, and full of knots and tangles, may as well expect to draw out an even and beautiful thread; a weaver, from a thread, here sleazy and there twisted to a wire, now coarse as cord, and now attenuated to a spider's line, may as well expect to form the elegant product of the loom; and a manufacturer, through all the stages of whose work the unskilfulness of each preceding process has redoubled the difficulties and imperfections of all succeeding ones, may as well expect to command the highest prices in the market, or to win the highest premiums at the Fair, as any one, subjected to the universal law of mortality, who thus violates the very preliminaries and antecedents of health, can expect to attain to that vigor and robustness of limb and frame, or to reach the full term of life, or to enjoy the mental capacities, for which a bounteous Providence had originally endowed him.

Yet how many of our social regulations pertaining to diet are a systematic infraction of these laws of nature. Some of them could not have contravened those laws more, had such been the express purpose of their adoption. The arrangements of many families, the short intermissions of our schools, and, in some instances, of our churches, and other public assemblies, the haste of travellers, the brief time occupied in eating in boarding-houses for work-people, whether mechanics in shops, or laborers on public works, or operatives in factories;—all these practices tend powerfully to depress the standard of health amongst us, and to expose us on all sides to the invasion of disease. In all these and in other particulars, the customs of our people have been adopted in ignorance of the laws of Physiology, and they will never be reformed until that ignorance is dispelled. Passengers in rail-road cars and on board steamboats, seem to eat with a rapidity suggested by their new powers of locomotion, as though the processes of nature could be expedited by their impatience of delay. Students in academies and colleges, when eating at a common table, are no exceptions to this general statement; and though an hour of mental relaxation and of social excitement,—*of hilarity, genial yet gentlemanly*,—is needed in an especial manner by students at their meals, yet, in many of our literary institutions, they are subjected to the Auburn and Sing-Sing discipline of eating in perfect silence.

[To be continued.]

Do the duty that lies nearest to thee; thy second duty will already have become cleared.

God draweth straight lines but we call them crooked.

[The Common School Journal; published semi-monthly, by William B. Fowle and N. Capen, No. 184 Washington Street, (corner of Franklin Street,) Boston. Horace Mann, Editor. Price, One Dollar a year.]